REMARKS

The above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated May 20, 2005. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-6 and 11-20 under consideration in this application. Claims 7-10 are being cancelled without prejudice or disclaimer. Claims 1, 11, 18, 20 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention.

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. All the amendments to the specification and the claims are supported by the specification, especially the drawings. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formality Rejections & Objections

Claims 11, 18 and 20 were objected to on informalities, and the Examiner has requested correction thereof. Claims 7-10 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 7-10 were rejected under 35 U.S.C. § 101 due to the claimed invention being directed to non-statutory subject matter.

As claims 11, 18 and 20 are being amended as suggested by the Examiner, the withdrawal of the outstanding informality objection is in order, and is therefore respectfully solicited. As claims 7-10 are being cancelled without prejudice or disclaimer, the rejections become moot.

Allowable Subject Matters

Claims 17 and 19 would be allowed if rewritten in independent form to include the limitations of the base claim and any intervening claims.

Prior Art Rejections

Claims 1-4 and 11-14 were rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,627,883 to Wang et al. (hereinafter "Wang"), and claims 5-6 and 15-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang and further in view of US Patent No. 5,652,427 to Whitehouse et al. (hereinafter "Whitehouse"). The prior art reference of Doroshenko et al. (5,696,376) was cited as being pertinent to the present application. These rejections have been carefully considered, but are most respectfully traversed.

The mass spectrometer of the invention (for example, the embodiment depicted in Fig. 1), as now recited in claim 1, comprises: an ion source 1; a *3D* quadrupole ion trap 9 (e.g., "*comprised of a pair of end cap electrodes 23 and 25, and a ring electrode 24*" P. 17, lines 12-24) for ejecting ions, after storing the ions generated by the ion source 1 and stored for a certain period of time therein; a Time-Of-Flight Mass Spectrometer (TOFMS) 18 for accelerating the ions ejected from the ion trap 9 in a direction orthogonal to the direction of their travel and measuring the time-of-flight of the accelerated ions; and a mass filter 8, which is disposed between the ion source and the ion trap and formed (e.g., "*The gas pressure inside the quadrupole filter 8 can be controlled by adjusting the gas flow rate of a gas tube 16 using a valve 14.*" P. 17, lines 3-5) to control a second gas pressure inside the mass filter 8 independently from a first gas pressure inside the ion trap 9 (e.g., via "*a tubing 17 and the ions passing into the ion trap .... The gas pressure inside the ion trap can be controlled by adjusting a flow rate of gas using a valve 15*" p. 16, lines 16-22).

The invention recited in claim 11 is directed to a mass spectrometric method comprising: generating sample ions at an ion source; ejecting the ions after storing the ions generated in the ion source at a 3D quadrupole ion trap for a pre-set period of time;

analyzing the masses of the ions and/or fragments generated by ion dissociation using a Time-of-Flight Mass Spectrometer, wherein the Time-of-Flight Mass Spectrometer accelerates the ions ejected from the ion trap in the direction orthogonal to the direction of their travel; and controlling the gas pressure inside a mass filter disposed between the ion source and the ion trap independently from the gas pressure inside the ion trap.

"*In the mass spectrometer combining the ion trap and the TOFMS, the quadrupole element is disposed at the front of the ion trap, at which isolation is performed. This structure enables the gas pressure inside the ion trap to be set in the region, where ion trapping efficiency, mass resolution, and CID efficiency are simultaneously maximized. On the other hand, the gas pressure inside the quadrupole element can be set to a relatively low level appropriate for isolation.*" This makes ion trapping efficiency, mass resolution, and CID efficiency improved simultaneously (p. 28, line 8 to p. 29, line 1; Fig. 4).

Applicants respectfully contend that none of the cited references teaches or suggests "a mass spectrometer comprising: an ion source; a ***3D*** quadrupole ion trap; an ion trap; and a mass filter 8 disposed between the ion source and the ion trap and formed to control a second gas pressure inside the mass filter 8 independently from a first gas pressure inside the ion trap 9" as the invention.

Contrary to the Examiner's assertion (p. 4, lines 2-3 of the outstanding Office Action) that Wang described "the selected ions then being passed to a three dimensional (3D) quadrupole ion trap 161 (col. 17, lines 5-36)," there is no description of any 3D quadrupole ion trap 161 in Wang. The ion trap 161 is comprised of a plurality of conducting electrode rods 195 (e.g., four, five, six, etc.) arranged in parallel (Figs. 6 -7) to form a linear (Abstract; col. 20, line 7) multipole structure (e.g., quadrupoles, pentapoles, hexapoles, octapoles, etc.) (Abstract; col. 17, lines 9-12).

Even though "Wang et al. further teaches that the mass filter is situated in a pressure region 164 and that the pressure in the region 168 is held at $4x10^{-5}$ mbar and that the pressure in region is set to $4x10^{-3}$ mbar when operating in MS/MS mode (col. 20, lines 9-10 and col. 11, line 33)" as asserted by the Examiner (p. 4, lines 6-10 of the outstanding Office Action), the mere fact that the two regains 164, 168 have two gas pressures does not support the idea that the alleged mass filter 169 in the region 168 is formed to control a second gas pressure therein independently from a first gas pressure inside the ion trap 161 in the region 164.

Wang merely uses potential differences (col. 16, line 60) to control the pumping speed in the three sections of the analytical multipole 169 in the region 168, rather than any air pressure. Since there is no gas introduced into the region 168 (Figs. 6-7), the gas pressure therein is inter-dependently (rather than "independently") controlled with a first gas pressure inside the ion trap 161 in the region 164. In fact, one of the example in Wang actually describes that the air pressure in bother the regions 164 and 168 are the same at $4x10^{-5}$ mbar (col. 20, lines 6-10).

Whitehouse was relied upon by the Examiner to teach the mass filter 8 comprised three-stage quadrupoles and has a controller for controlling gas pressure so that the gas pressure inside the second-stage quadrupole is lower than those inside the first-stage and the third-stage quadrupoles of the invention as recited in claim 5. However, Whitehouse varies air pressures in the multiple pumping stage multipole ion guides by their configurations, i.e., rod diameter and rod spacing and the vacuum pumps (col. 5, lines 14-40; Fig. 1). The gas pressure is higher at the beginning pumping stage and then decreasing through subsequent pumping stages ("*the rod diameter and rod spacing in the multipole ion guide assemble were*

configured small enough to minimize the transmission of neutral gas through the ion guide into down stream pumping stages" col. 5, lines 20-26). For example, the pressure in the 1st vacuum stage 7 is maintained at 0.4 to 20 torr, the pressure in the 2nd vacuum stage 12 is maintained at 5 to 200 millitorr, the pressure in the 3rd vacuum stage 20 is maintained at $1*10^{-3}$ to $8*10^{-5}$ torr (col. 8, lines 1-25). As such, the gas pressure in the pumping stage in Whitehouse are inter-dependently controlled, rather than independently controlled. In addition, the gas pressure in the second-stage is lower than those inside the first-stage but higher (rather than "lower") than the third-stage.

Applicants contend that none of the cited references discloses each and every feature of the present invention as disclosed in independent claims 1 and 11. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and telephone number indicated below.

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